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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/677,241

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EXAMINER

MOTSINGER, SEAN T

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/677,241	Applicant(s) SAKAIDA, HIDEYUKI	
	Examiner SEAN MOTSINGER	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3 and 5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/6/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

Response to Applicants Arguments/ Amendments

Applicants arguments/amendments filed on 8/6/2008 have been entered and made of record.

Regarding applicants arguments with respect to double patenting; a terminal disclaimer has overcome double patenting rejections to U.S. Patent No. 7171031. However the remaining double patenting rejection have not been addressed by this action.

Regarding applicants arguments with respect to admitted prior art. Conventional approaches are admitted prior art.

Regarding applicants argument with respect to 35 U.S.C. 103 applicants arguments have been fully considered but are moot in view of new grounds of rejection.

Double Patenting

Claims 1-6 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6704591 ("591") in view of Wilkins et al US 6,493,422 and Smith US 4947,323

Claim 1 of the '591 patent recites

A method of restoring phase information of radiation transmitted through an object on the basis of a plurality of image signals respectively **obtained by detecting intensity** of radiation transmitted through the

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object on a plurality of planes different in distance from the object, each of the plurality of image signals representing radiation image information on the plurality of planes, said method comprising the steps of: **obtaining a differential signal** representing difference between a first image signal and a second image signal of said plurality of image signals; ... **obtaining Laplacian of phase** with respect to said differential signal and said third image signal; and restoring phase information of the radiation by **applying an inverse Laplacian operation** to said Laplacian of phase.

which reads on claim 1 of the application

(a) **obtained by detecting intensity** of radiation on plural detection planes at different distances from the object, said plural sets of detection data representing radiation image information on the plural detection planes, respectively; (b) **obtaining differential data** representing difference between first detection data and second detection data of said plural sets of detection data; (c) **obtaining Laplacian of phase** on the basis of said differential data and any one of said plural sets of detection data and the detection data; and (d) obtaining phase data of the radiation by **performing inverse Laplacian computation** on the Laplacian of phase.

Claim 1 of the '591 patent does not recite correcting blur amount or a magnification ratio.

Wilkins discloses performing image processing so as to uniform magnification ratios of said first and second detection data (see column 10 equation 18 and lines 40-50). The motivation to combine taking magnification into account ... "is more appropriate for phase imaging with a point source" column 10 lines 50-50. Therefore one of ordinary skill in the art would have found it obvious to combine Wilkins with Gureyev to reach the aforementioned advantage.

Smith discloses correcting blur amount by filter processing using a blur function according to a distance from an object caused by a focal size of a radiation source (see claim 1). The combination of Smith and Gureyev would result in the blur correction of Smith being applied to each of the detection data of

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Gureyev removing the focal spot blur from each image of Gureyev (or Wilkins) would cause the blur amounts to be uniform. The motivation to combine is to remove the blur (see abstract).

Claims 1-6 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 3-4 and 11-12 of copending Application No. 10/671,786 ("786") in view Wilkins et al US 6,493,422 and Smith US 4947,323.

Claim 3 of the '786 application recites

(a) **obtaining plural sets of detection data** respectively representing plural kinds of radiation image information on plural detection planes at different distances from the object by using a radiation having a predetermined wavelength with energy from 16 keV to 30 keV to **detect intensity** of the radiation on said plural detection planes; and (b) restoring phase information on the radiation transmitted through the object on the basis of **obtaining a differential coefficient** between said plural sets of detection data; so-as-to obtain phase data (c) **calculating a Laplacian of phase** on the basis of said differential coefficient and any one of said plural sets of detection data; and (d) **performing inverse Laplacian computation** on the Laplacian of phase to obtain the phase information.

which reads on claim 1 of the application

(a) **obtained by detecting intensity** of radiation on plural detection planes at different distances from the object, **said plural sets of detection data** representing radiation image information on the plural detection planes, respectively; (b) **obtaining differential data** representing difference between first detection data and second detection data of said plural sets of detection data; (c) **obtaining Laplacian of phase** on the basis of said differential data and any one of said plural sets of detection data and the detection data; and (d) obtaining phase data of the radiation by **performing inverse Laplacian computation** on the Laplacian of phase.

Claim 3 of the '786 application does not recite correcting blur amount or magnification ratio. Wilkins discloses performing image processing so

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as to uniform magnification ratios of said first and second detection data (see column 10 equation 18 and lines 40-50). The motivation to combine taking magnification into account ... "is more appropriate for phase imaging with a point source" column 10 lines 50-50. Therefore one of ordinary skill in the art would have found it obvious to combine Wilkins with Gureyev to reach the aforementioned advantage.

Smith discloses correcting blur amount by filter processing using a blur function according to a distance from an object caused by a focal size of a radiation source (see claim 1). The combination of Smith and Gureyev would result in the blur correction of Smith being applied to each of the detection data of Gureyev removing the focal spot blur from each image of Gureyev (or Wilkins) would cause the blur amounts to be uniform. The motivation to combine is to remove the blur (see abstract).

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 1, 3, 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gureyev (cited in the previous action) in view of Wilkins et al US 6,493,422 and Smith US 4947,323.

For claims 1, 3 and 5, Gureyev discloses “first detection data (page 359 $I(r,R)$) and second detection data (page 359 $I(r,0)$) obtained by detecting intensity of radiation on plural detection planes (distance of R and 0 page 359) at different distances from the object (distance of R and 0 page 359) and representing radiation image information on the plural detection planes ”

The combination of Gureyev discloses “obtaining differential data representing difference between first detection data and second detection data of said plural sets of detection data.” (See page 359, “processing of the differential images.”)

Gureyev discloses “obtaining Laplacian of phase on the basis of said differential data and any one of said plural sets of detection data.” (See equation 3a which obtains the Laplacian of phase data, page 6 of the specification which obtains the Laplacian of phase on the basis of the difference data, and page 17 of the specification which discusses using plural sets of detection data to obtain phase information).

The Gureyev discloses “obtaining phase data of the radiation by performing inverse Laplacian computation on the Laplacian of phase.” (See page 360 “There are many well-known methods for solving equations of the type (2) and (3).” Equation 3a expresses the Laplacian of phase, a person of ordinary skill in the art at the time of invention is able to obtain phase data by taking the

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inverse Laplacian on the Laplacian of phase as discussed on page 360 and page 6 admitted prior art in the specification, which takes the inverse Laplacian of equation 4 using the finite-element method).

Wilkins discloses performing image processing so as to uniform magnification ratios of said first and second detection data (see column 10 equation 18 and lines 40-50). The motivation to combine taking magnification into account ... "is more appropriate for phase imaging with a point source" column 10 lines 50-50. Therefore one of ordinary skill in the art would have found it obvious to combine Wilkins with Gureyev to reach the aforementioned advantage.

Smith discloses correcting blur amount by filter processing using a blur function according to a distance from an object caused by a focal size of a radiation source (see claim 1). The combination of Smith and Gureyev would result in the blur correction of Smith being applied to each of the detection data of Gureyev removing the focal spot blur from each image of Gureyev (or Wilkins) would cause the blur amounts to be uniform. The motivation to combine is to remove the blur (see abstract).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**.

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See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN MOTSINGER whose telephone number is (571)270-1237. The examiner can normally be reached on 9-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571)272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jingge Wu/
Supervisory Patent Examiner, Art Unit 2624

Motsinger
12/19/2008